

We claim:

SacC1 > 1. A nucleic acid molecule encoding a protein with the function of a wheat starch synthase, selected from the group consisting of

5 (a) a nucleic acid molecule encoding a protein comprising the amino acid sequence shown under Seq ID NO. 2,

(b) a nucleic acid molecule comprising the nucleotide sequence shown under Seq ID ~~NO.~~ 1 or a part thereof, or a ribonucleotide sequence corresponding herewith;

10 (c) a nucleic acid molecule which hybridizes with one of the nucleic acid molecules mentioned under (a) or (b) or is complementary thereto, and

(d) a nucleic acid molecule whose nucleotide sequence deviates from the sequence of a nucleic acid molecule mentioned under (a), (b) or (c) owing to the degeneracy of the genetic code.

20 2. A nucleic acid molecule as claimed in claim 1, which is a DNA molecule.

3. A DNA molecule as claimed in claim 2, which is a cDNA molecule.

25 4. A nucleic acid molecule as claimed in one or more of claims 1 to 3, containing regulatory elements: *Claim 1*

5. A nucleic acid molecule as claimed in claim 1, which is an RNA molecule.

30 6. A nucleic acid molecule which specifically hybridizes with a nucleic acid molecule as claimed in any of claims 1 to 5. *Claim 1*

7. A nucleic acid molecule as claimed in claim 6, which is an oligonucleotide with a length of at least 15 nucleotides.

35 8. A vector containing a DNA molecule as claimed in any of claims 1 to 5. *Claim 1*

Spec 2 >

9. A vector as claimed in claim 8, wherein said nucleic acid molecule is linked in sense orientation to regulatory elements which ensure transcription and synthesis of a translatable RNA in pro- or eukaryotic cells.

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10. A vector as claimed in claim 8, wherein said nucleic acid molecule is linked in sense orientation to regulatory elements which ensure the synthesis of an untranslatable RNA in pro- or eukaryotic cells.

10 11. A vector as claimed in claim 8, wherein said nucleic acid molecule is linked in antisense orientation to regulatory elements which ensure the synthesis of an untranslatable RNA in pro- or eukaryotic cells.

15 12. A host cell which is transformed with a nucleic acid molecule as claimed in one or more of claims 1 to 5 or with a vector as claimed in one or more of claims 8 to 11 or which is derived from such a cell.

Spec 1

20 13. A protein encoded by a nucleic acid molecule as claimed in ~~one or more of claims 1 to 4~~.

25 14. A process for the preparation of a protein as claimed in claim 13, wherein a host cell as claimed in claim 12 is cultured under conditions which permit said protein to be synthesized, and said protein is isolated from the cultured cells and/or the culture medium.

15. A process for generating a transgenic plant cell, wherein

a) a nucleic acid molecule as claimed in one or more of claims 1 to 5 or

b) a vector as claimed in one or more of claims 8 to 11

30 35 is integrated into the genome of a plant cell.

16. A transgenic plant cell which has been transformed with a nucleic acid molecule as claimed in one or more of claims 1 to 5 or with a vector as claimed in one or more of claims 8 to 11 or which is derived from such a cell.

17. A process for generating a transgenic plant cell, wherein

5 a1) a nucleic acid molecule as claimed in one or more of claims 1 to
5 or
a2) a vector as claimed in one or more of claims 8 to 11
is integrated into the genome of a plant cell and
b) a complete plant is regenerated from said plant cell.

18. A plant containing a plant cell as claimed in claim 16.

10 19. A plant as claimed in claim 19, which is a monocotyledonous or
dicotyledonous plant.

20. A plant as claimed in claim 19, which is a useful plant.

15 21. A plant as claimed in claim 20, which is a starch-storing plant.

20 22. A plant as claimed in claim 21, which is a maize, rice, potato or
wheat plant.

23. Propagation material of a plant as claimed in ~~one or more of claims~~
20 18 to 22.

25 24. Starch obtainable from a plant cell as claimed in claim 16, from a
plant as claimed in one or more of claims 18 to 22 or from
propagation material as claimed in claim 23.

25 25. The use of the starch as claimed in claim 24 for the production of
foodstuffs or foodstuff precursors, preferably baked goods or pasta.

30 26. The use of the starch as claimed in claim 24 for the production of
packaging materials or disposable articles.

Claim 8

*add
C4*